

# THE WYANDOTTE LOCAL FAUNA: A NEW, DATED, PLEISTOCENE VERTEBRATE FAUNA FROM NORTHERN QUEENSLAND

G.C. McNAMARA

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□ Pleistocene, Queensland, Wyandotte Formation, vertebrates, *Megalanina*, *Wonambi*, *Meiolania*, teleost, crocodile, birds, marsupials, mammals.

G.C. McNamara, Geology Department, James Cook University of North Queensland, Townsville, Queensland 4811, Australia; 30 November, 1988.

Fossil bones were collected and brought to the attention of the author in 1983 by Messrs Gary Ferguson and Glenn Smith, then of Noranda Australia Ltd. A preliminary investigation revealed a moderately abundant and diverse fauna of Pleistocene aspect deposited in close proximity to a dated basalt. Further investigation was warranted because of the rarity of datable vertebrate deposits of any age in northern Queensland.

## THE WYANDOTTE FORMATION

The Wyandotte Formation is a fossil-bearing sequence that outcrops in ribbon-like aspect along the banks of Wyandotte Creek, a tributary of the Dry River, N Queensland. Eleven sites yielding fossils have been located within the mapped area (Fig. 1). Isolated fossils have been found *in situ* in many other localities.

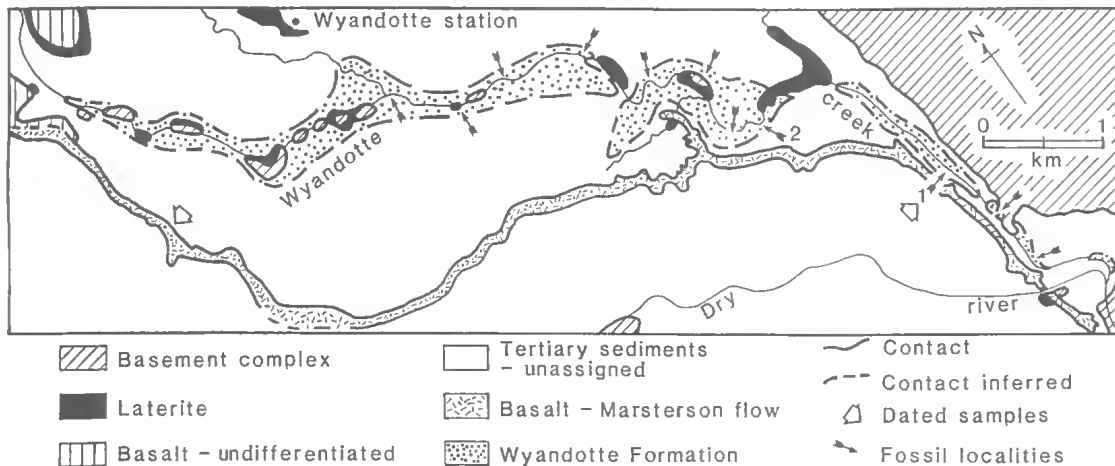


FIG. 1. Mapped extent of the Wyandotte Formation and position of the known fossil localities. Localities labelled 1 and 2 produced the bulk of the fauna. K/Ar dating was performed on a basalt sample taken in the west of the mapped area.

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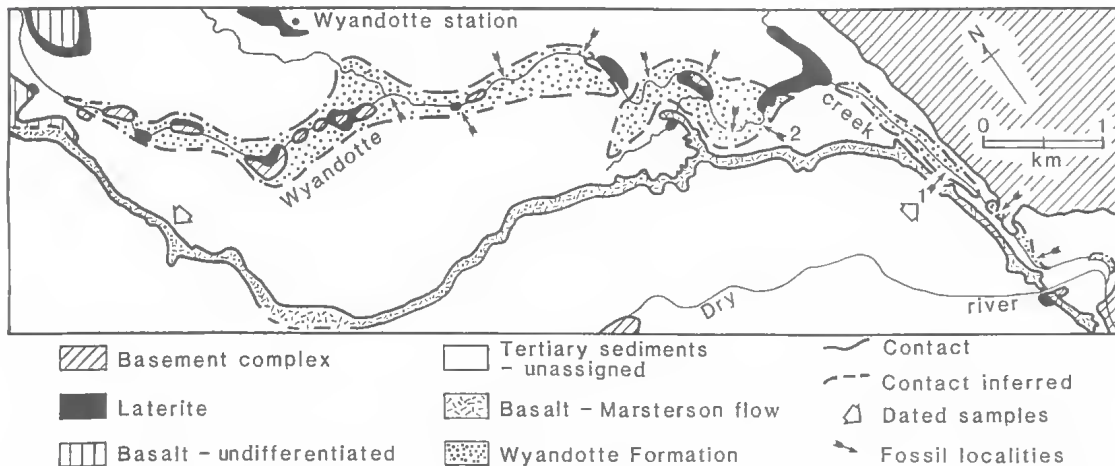


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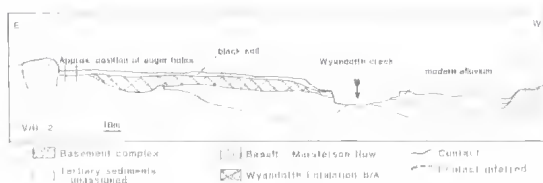


FIG. 2. Idealized cross-section through site 1 normal to the line of the basalt flow and modern creek trends as indicated by the site 1 "fossil locality" arrow in Fig. 1.

### GEOCHRONOLOGY AND STRATIGRAPHY

The Wyandotte Formation overlies Precambrian and Palaeozoic basement, weathered and lateritized basement, lateritized early Tertiary sediments and unlateritized, unassigned, Tertiary sediments. Lateritization of basement and early Tertiary sediments occurred during the Oligocene to early Miocene (Grimes, 1980), and this provides a maximum date for any overlying fossiliferous sediments in the region. The age of the unassigned Tertiary sediments is unknown, but within the study area they are indurated and show features reminiscent of the late Pliocene Campaspe Beds further to the south (Nind, 1988; Wyatt & Webb, 1970). A basalt flow (informally named the Marsterson flow) from the McBride Basalt Province, dated at 410,000 ybp (Griffin & McDougall, 1976), fills a palaeodrainage incision in these indurated sediments (Fig. 1). Fossils have not been recorded from these undated sediments.

There is no outcrop relationship between the dated basalt flow and the Wyandotte Formation. To the north of the flow, unassigned Tertiary sediments form a contemporary surface which is nearly level with the weathered surface of the flow. To the south, on the Wyandotte Creek side of the flow, a bluff of blocky basalt up to several metres high, drops away to a contemporary surface of black soil. The Wyandotte Formation overlies the unassigned Tertiary sediments and thins towards the basalt. Auger drill holes taken close to the basalt indicate only unassigned Tertiary sediments under the black soil, confirming that the Wyandotte Formation does not underlie the basalt (Fig. 2). This is consistent with the basalt flow occupying a higher topographic position than the younger Wyandotte Formation sediments, topographic inversion of this kind being common in basalt terrains (Coventry *et al.*, 1985).

The probable explanation of the observed differences north and south of the basalt flow is that after the infill of the palaeodrainage by the basalt, the drainage switched to the south side of the flow and cut a new channel in unassigned Tertiary sediment. A new valley formed, and fossil-bearing Wyandotte Formation sediments and black soil cover accumulated. A new erosive phase is now reworking these fossiliferous sediments.

The Wyandotte Formation consists of two lithofacies associations, Units A and B. Unit A is basal and is comprised of two distinct lithofacies: a granule gravel with clay matrix, and a blue-grey, carbon-flecked clay. The granule gravel forms a definite basal horizon, together with lenses and stringers higher in the section, but the blue-grey clay dominates the unit. Minor diatomaceous clays occur elsewhere as part of Unit A. Unit B also consists of two lithofacies: a gravel with clean sand matrix, and a medium to fine-grained, cross-laminated sand. Together they form an upwards-fining sequence typical of lateral accretion fluvial facies. Minor laminated mud lenses and drape horizons occur within the unit.

The base of the Wyandotte Formation is beyond conventional  $^{14}\text{C}$  range ( $>45,000$  ybp — University of Waikato Radiocarbon Dating Laboratory results; test carried out on carbonized wood taken *in situ* from site 1). The rate of downcutting to form the valley is not known, but since 410,000 ybp a substantial valley has been cut. Between 4 to 10 metres of Unit A were deposited prior to Unit B, which has a basal date of 30,400 ybp ( $+750/-700$  yrs — UWRDL results; test carried out on bivalve shells taken *in situ* from site 1). It is reasonable to suppose that the erosive phase might easily have taken half of the available interval, a corollary of which is that the base of the Wyandotte Formation may not be much older than 200,000 ybp. The cause of the onset of sedimentation is not known, but may well be related to Pleistocene climatic changes as the Unit A facies are typical of meander cutoff vertical accretion facies which are suggestive of high runoff and frequent flooding. Elsewhere on the southern margin of the McBride Province flows younger than 100,000 ybp disrupted drainage (Griffin & McDougall, 1976), perhaps contributing to damming of the Wyandotte valley region.

The duration of the hiatus between final deposition of Unit A and the onset of Unit B deposition is unknown. Contacts between Units A and B range from planar horizontal to overhanging. Outcrops indicate that local scouring prior to deposition of Unit B extended to a

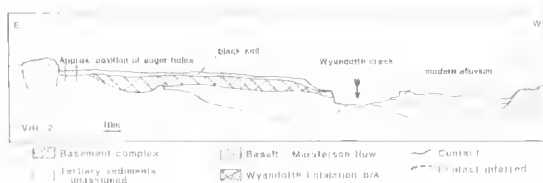


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minimum of one metre. Load casting is not evident even where boulders half a metre in diameter rest directly on the contact. This indicates significant compaction and dewatering of Unit A clays prior to the onset of erosion and Unit B deposition, implying that the upper horizons of Unit A are considerably older than the base of Unit B. Black soil is the youngest sediment in the region and mantles only those regions within flood range of the modern watercourses draining the basalt terrains to the north.

## WYANDOTTE LOCAL FAUNA

The Wyandotte local fauna is summarized below. As this paper represents the first appraisal of the Wyandotte Local Fauna, no attempt has been made to describe all taxa in detail, but where good material exists and where I had access to comparative material, diagnostic descriptions have been included. It is hoped that the Wyandotte Fauna will be thoroughly investigated as part of a long-overdue review of the Pleistocene of north Queensland. Dental terminology follows Archer (1974, 1975), and the informal term "Local Fauna" is adopted from Tedford (1970). Catalogue numbers refer to specimens catalogued and held in the Museum of Victoria. The letters A & B indicate which formation units yielded identified specimens. F indicates the specimen was not *in situ*.

## MOLLUSCA

Bivalvia	
<i>Sphaerium</i> sp.	A & B
<i>Vesunio</i> sp.	A & B
Gastropoda	
<i>Plotiopsis</i> sp.	A & B

## OSTEICHTHYS

Teleostei	
Spines, vertebrae and other bones	A

## REPTILIA

Meiolanidae	
<i>Meiolania</i> cf <i>M. platyceps</i>	A
Chelidae	A & B
Crocodylidae	
<i>Pallimnarchus</i> sp.	A & B
ziphodont crocodilian	A
Varanidae	
<i>Megalania prisca</i>	A & B
Boidae	

<i>Wonambi</i> cf <i>W. naracoortensis</i>	F
?Elapidae	
two small, unidentified vertebrae	A

## AVES

Anhingidae	
<i>Anhinga melanogaster</i>	B
Anatidae	
<i>Anseranas semipalmata</i>	A
<i>Anas ?superciliosa</i>	A
<i>Anas ?castanea</i>	A

## MAMMALIA

Marsupialia	
Dasyuridae	
<i>Dasyurus</i> sp.	F
<i>Antechinus</i> sp.	A
Peramelidae	
<i>Isodon macrourus</i>	A
Vombatidae	
<i>Phascogale</i> sp.	F
Macropodidae	
Unidentified macropodids	A & B
Palorchestidae	
Unidentified palorchestid	A
Diprotodontidae	
? <i>Euowenia</i> sp.	F
<i>Diprotodon optatum</i>	F
Unidentified diprotodontid	A
Eutheria	
Muridae	
<i>Rattus</i> sp.	A & B
? <i>Pseudomys</i> sp.	A

## DESCRIPTIONS

## MOLLUSCA

Mollusc shells form a significant clastic component in some lithofacies in Unit B, but are relatively uncommon in Unit A. Where they are concentrated in Unit A they form a chalky hash, indicating both destruction in the clastic environment and dissolution in the diagenetic environment. Two bivalves (*Sphaerium* sp. and *Vesunio* sp., Figs 3A, B) and a gastropod (*Plotiopsis* sp., Fig. 3C) are identified (pers. comm., L. Benson, James Cook University Tropical Freshwater Research Unit). Specific identifications are not possible because freshwater mollusc taxonomy relies on soft tissues for diagnostic features.

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Spines, vertebrae and other bones	A

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<i>Meiolania</i> cf <i>M. platyceps</i>	A
Chelidae	A & B
Crocodylidae	
<i>Pallimnarchus</i> sp.	A & B
ziphodont crocodilian	A
Varanidae	
<i>Megalania prisca</i>	A & B
Boidae	

<i>Wonambi</i> cf <i>W. naracoortensis</i>	F
?Elapidae	
two small, unidentified vertebrae	A

## AVES

Anhingidae	
<i>Anhinga melanogaster</i>	B
Anatidae	
<i>Anseranas semipalmata</i>	A
<i>Anas ?superciliosa</i>	A
<i>Anas ?castanea</i>	A

## MAMMALIA

Marsupialia	
Dasyuridae	
<i>Dasyurus</i> sp.	F
<i>Antechinus</i> sp.	A
Peramelidae	
<i>Isodon macrourus</i>	A
Vombatidae	
<i>Phascogale</i> sp.	F
Macropodidae	
Unidentified macropodids	A & B
Palorchestidae	
Unidentified palorchestid	A
Diprotodontidae	
? <i>Euowenia</i> sp.	F
<i>Diprotodon optatum</i>	F
Unidentified diprotodontid	A
Eutheria	
Muridae	
<i>Rattus</i> sp.	A & B
? <i>Pseudomys</i> sp.	A

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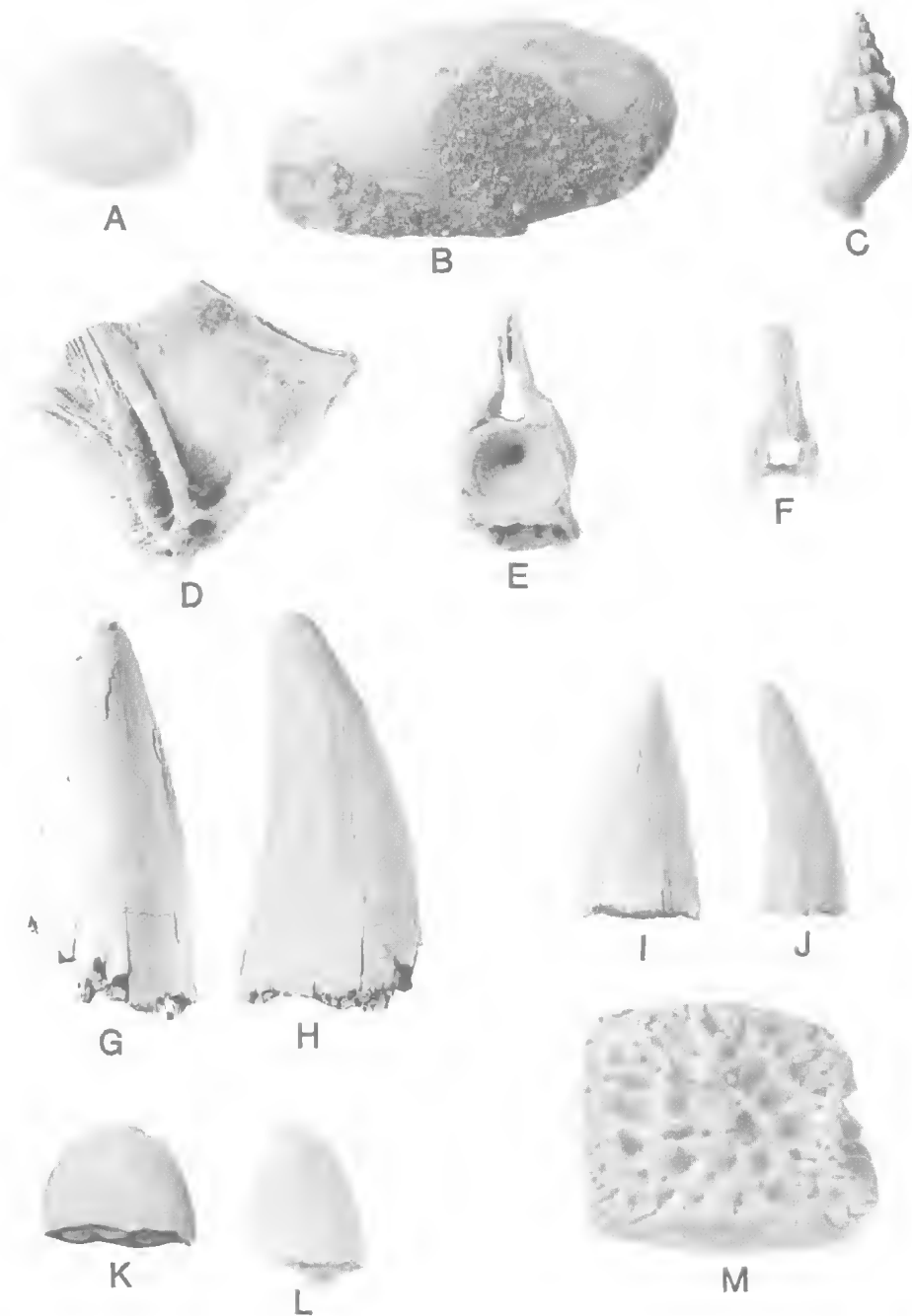


FIG. 3. A. Bivalve, *Sphaerium* sp., X 1.0. B. Bivalve, *Velesunio* sp. with some cemented matrix attached, X 0.75. C. Gastropod, *Plotiopsis* sp., X 1.5. D. Teleost operculum, X 2.0. E. Teleost vertebra, X 2.0. F. Teleost spine, X 2.0. G, H. Conical crocodile tooth (P184006), representative of tooth types i) and ii) in shape but showing the posterior — anterior keel of type ii) specimens, in lateral (G) and anterior — posterior (H) aspects. X 1.0. I, J. Laterally compressed, pointed crocodile tooth ovoid in section (P184010), representative of tooth type iii), in lateral (I) and anterior — posterior (J) aspects. X 1.0. K, L. Laterally compressed, blunt, crocodile tooth ovoid in section (P186638), representative of tooth type iv), in lateral (K) and anterior — posterior (L) aspects. X 2.0. M. Dorsal crocodile scute (P184004) in dorsal aspect, X 0.5.

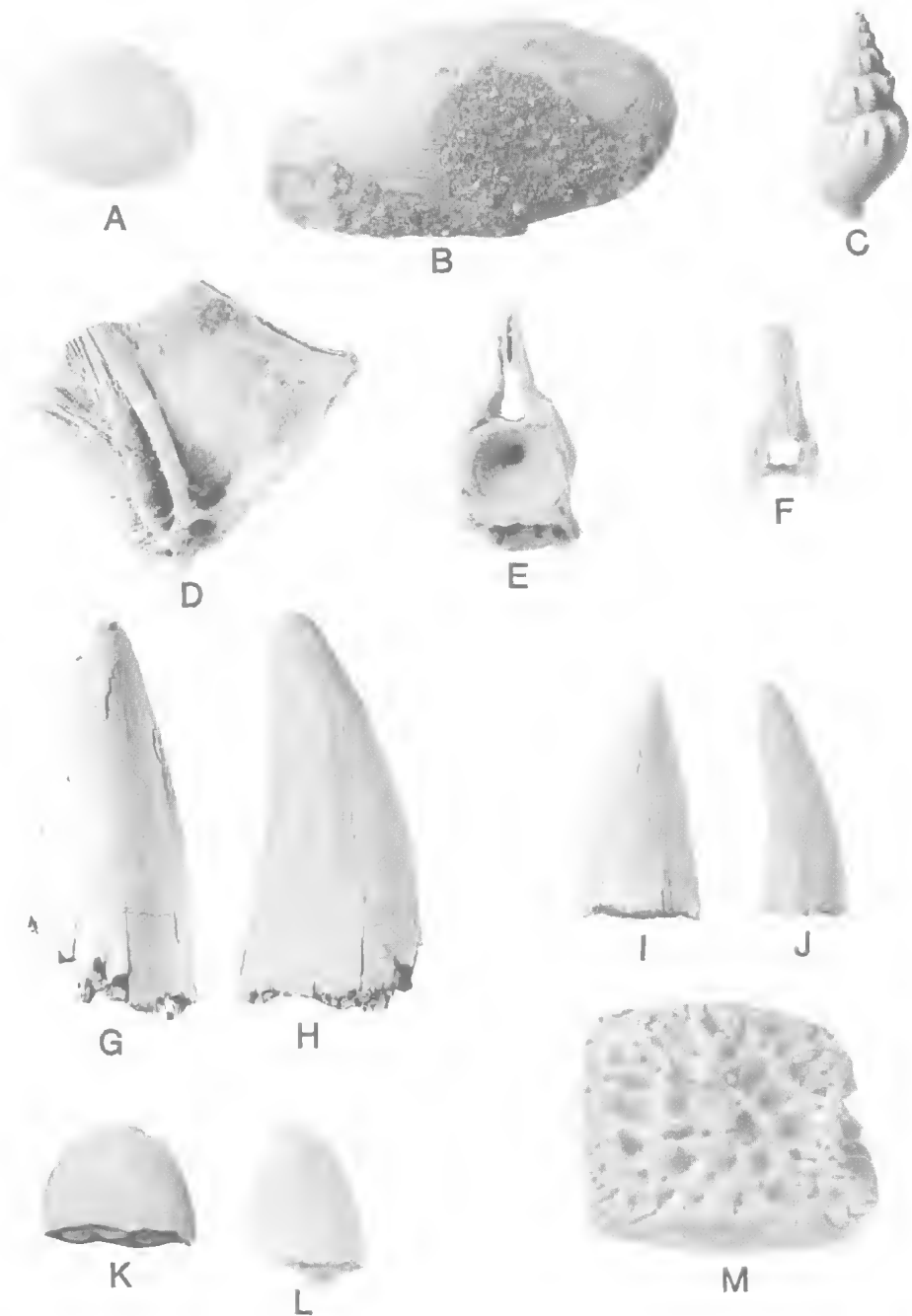


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## OSTEICHTHYES

### TELEOSTEI

Fish spines, vertebrae and opercula are relatively uncommon in Unit A, although small lenses have yielded large amounts of fish material (Figs 3D, E, F). A small lens of diatomaceous clay in Unit A contained a series of articulated fish vertebrae (P186596). This is the only articulated material known from the deposit. Some spines (e.g. P184046) have ornamentation suggestive of affinities with modern catfish eels but no other diagnostic bones have been discovered.

### REPTILIA

#### CHELIDAE

Turtle carapace and plastron fragments are the most common fossils in both Units A and B. Gaffney (1981) indicates that ornamentation and suture features are not diagnostic even to a generic level and hence no identifications can be made except to say that many of the bones are most probably from chelids (E. Gaffney, pers. comm.).

#### MEIOLANIDAE

##### *Meiolania* cf. *M. platyceps*

Three horn cores (P183195, P183196, P183197) and a caudal vertebra (P183198), all unusually large, were retrieved from the basal gravel of Unit A. Two of the horn cores were found in close association and could well be from the same individual. Details of these remarkable fossils are discussed elsewhere (Gaffney & McNamara, this volume).

#### CROCODYLIDAE

Fragments from crocodiles are the most common fossils, next to those of turtles. Forty-seven teeth, four vertebrae and seven dermal scutes are recorded. Four distinct tooth types are recognised: i) Conical and pointed, with no anterior-posterior keel and no serrations; fluting variable (e.g. P184034). ii) Conical and pointed with noticeable anterior-posterior keels, both of which are serrated along their length; fluting variable (e.g. P184006, Figs 3G, H).

iii) Laterally compressed, pointed and ovoid in section, with entirely serrate anterior and posterior keels and variable curvature within the plane of compression (e.g. P184010, Fig. 3 I, J).

iv) Laterally compressed, blunt and ovoid in section, with serrate ridge from most anterior to most posterior position in the plane of compression; ridge sometimes with flexure near crown (e.g. P186638, Figs 3K, L).

All four types have been reported previously in Australian literature (see below).

The four procoelous vertebrae (e.g. P184061) are all large, as are six of the seven dermal scutes (e.g. P184004, Fig. 3M). All are typically crocodilian but not enough comparative material is available to allow closer identification.

##### *Pallimnarchus* sp.

Within Australia only the fossil genera *Pallimnarchus* and *Crocodylus* are known to have teeth of the conical form described as i) and ii) above. Molnar (1981) noted that the main distinction between these genera is the serrations, but added that this distribution is dubious as insufficient *Pallimnarchus* cranial material exists and dental documentation for *Crocodylus* is inadequate. Consequently the conical teeth from Wyandotte Creek might belong to either or both; they are ascribed to *Pallimnarchus* only on the basis that this is the form more commonly described from inland Queensland deposits.

##### Ziphiodont crocodilian(s)

The laterally compressed condition, or ziphiodonty, in serrate crocodilian teeth is known in both eusuchians and sebosuchians and both are reported from Australia (Molnar, 1981; Hecht & Archer, 1977, respectively), thereby making inferences, even about the ordinal status of these fossils, difficult. Hecht and Archer (1977) argued that markedly blade-like, partially recurved crowns distinguish sebosuchian ziphioid teeth, but the degree of compression and recurvature within the Wyandotte sample is highly variable. Some specimens are remarkably similar to *Megalania* teeth except that, unlike the limited serrations on the anterior edge of *Megalania* teeth, the ziphioid teeth serrations are continuous. The basal fluting of *Megalania* teeth is also far more pronounced than fluting on ziphioid teeth. Langston (1956) considered that isolated ziphioid teeth are not diagnostic. Given this uncertainty, no attempt has been made to classify them further. The distinctly

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#### CROCODYLIDAE

Fragments from crocodiles are the most common fossils, next to those of turtles. Forty-seven teeth, four vertebrae and seven dermal scutes are recorded. Four distinct tooth types are recognised: i) Conical and pointed, with no anterior-posterior keel and no serrations; fluting variable (e.g. P184034). ii) Conical and pointed with noticeable anterior-posterior keels, both of which are serrated along their length; fluting variable (e.g. P184006, Figs 3G, H).

iii) Laterally compressed, pointed and ovoid in section, with entirely serrate anterior and posterior keels and variable curvature within the plane of compression (e.g. P184010, Fig. 3 I, J).

iv) Laterally compressed, blunt and ovoid in section, with serrate ridge from most anterior to most posterior position in the plane of compression; ridge sometimes with flexure near crown (e.g. P186638, Figs 3K, L).

All four types have been reported previously in Australian literature (see below).

The four procoelous vertebrae (e.g. P184061) are all large, as are six of the seven dermal scutes (e.g. P184004, Fig. 3M). All are typically crocodilian but not enough comparative material is available to allow closer identification.

##### *Pallimnarchus* sp.

Within Australia only the fossil genera *Pallimnarchus* and *Crocodylus* are known to have teeth of the conical form described as i) and ii) above. Molnar (1981) noted that the main distinction between these genera is the serrations, but added that this distribution is dubious as insufficient *Pallimnarchus* cranial material exists and dental documentation for *Crocodylus* is inadequate. Consequently the conical teeth from Wyandotte Creek might belong to either or both; they are ascribed to *Pallimnarchus* only on the basis that this is the form more commonly described from inland Queensland deposits.

##### Ziphiodont crocodilian(s)

The laterally compressed condition, or ziphiodonty, in serrate crocodilian teeth is known in both eusuchians and sebosuchians and both are reported from Australia (Molnar, 1981; Hecht & Archer, 1977, respectively), thereby making inferences, even about the ordinal status of these fossils, difficult. Hecht and Archer (1977) argued that markedly blade-like, partially recurved crowns distinguish sebosuchian ziphioid teeth, but the degree of compression and recurvature within the Wyandotte sample is highly variable. Some specimens are remarkably similar to *Megalania* teeth except that, unlike the limited serrations on the anterior edge of *Megalania* teeth, the ziphioid teeth serrations are continuous. The basal fluting of *Megalania* teeth is also far more pronounced than fluting on ziphioid teeth. Langston (1956) considered that isolated ziphioid teeth are not diagnostic. Given this uncertainty, no attempt has been made to classify them further. The distinctly

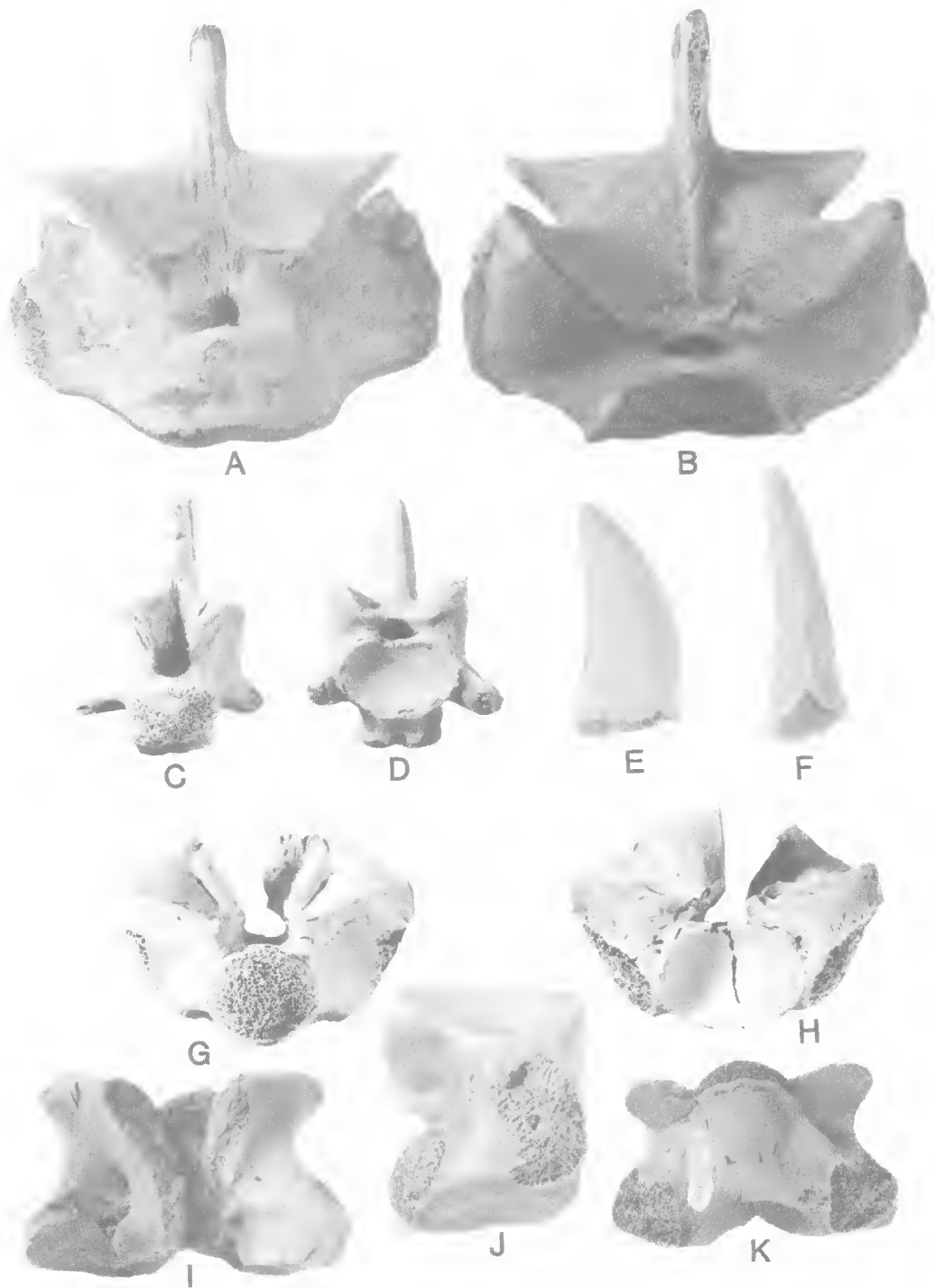


FIG. 4. A, B. *Megalania prisca* massive presacral vertebra (P184048) in anterior (A) and posterior (B) aspects, X 0.5. C, D. Large varanid postsacral vertebra (P186587) in anterior (C) and posterior (D) aspects, X 1.0. E, F. *Megalania prisca* tooth (P186591) in lateral (E) and posterior (F) aspects, X 2.0. G, H, I, J, K. *Wonambi* cf. *W. naracoortensis* vertebra (P186652) in anterior (G), posterior (H), dorsal (I), lateral (J) and ventral (K) aspects, X 1.0.

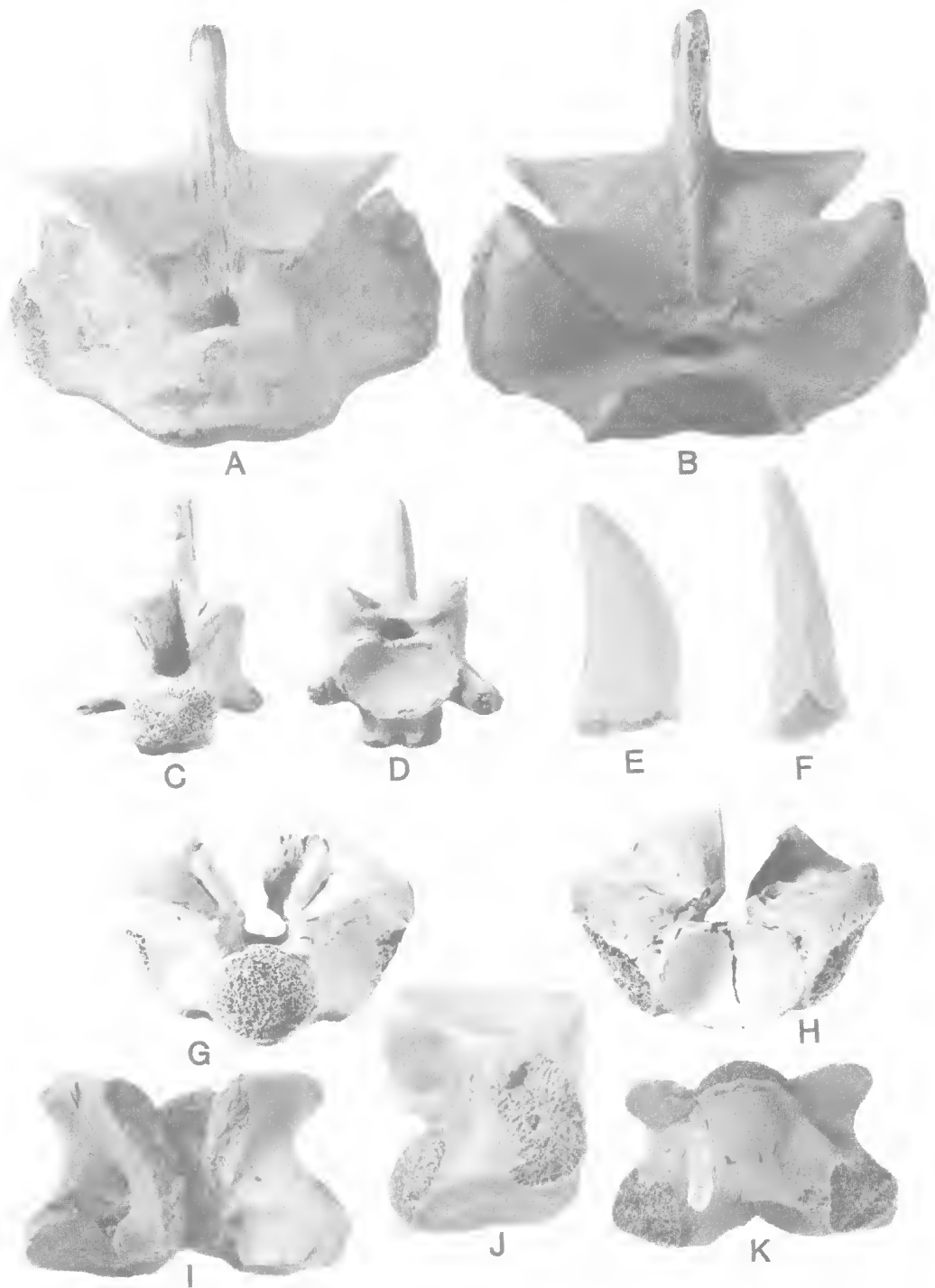


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different pointed and blunt types of ziphoid teeth also raise the question of whether they represent a single heterodont crocodilian or several homodont crocodilian species. These questions will be resolved only when more complete material is found.

### VARANIDAE

Nine vertebrae (six large, three small) are typically varanid; they are procoelous, with centra constricted anterior to the condyles, weakly-developed zygosphenes on thoracic vertebrae, and postero-ventral pedicles for the haemal arches on the caudal vertebrae.

#### *Megalania prisca*

Six of the nine varanid vertebrae are massive presacrals (e.g. P184048, Figs 4A, B), and possess weakly-developed zygosphenes and small, depressed neural canals. These features typify *Megalania*, and all six specimens fall into the known size-range (Hecht, 1975). One of the three postsacrals (P184056) falls within the recorded size-range for *Megalania* while the other two are probably *Megalania* given their massive appearance and relatively large size (e.g. P186587, Figs 4C, D).

Seven large varanid teeth (e.g. P186591, Figs 4E, F) are attributed to *Megalania*. They are distinctive among varanids in having a recurved inclination distally, a rounded anterior cutting edge, serrated only distally, and a thin posterior cutting edge, blade-like and serrated along its entire length. All are of a size consistent with known *Megalania* specimens (Hecht, 1975).

### OPHIDIA

Three procoelous vertebrae with zygosphenes-zygantrum articulations are attributed to snakes.

### BOIDAE

P186652 is recognised as a boid due to its lack of distinct parapophyseal processes.

#### *Wonambi* cf. *W. naracoortensis*

P186652 displays the following features: a pair of paracotylar foramina, zygosphenal facets approximately 70° to horizontal, zygosphenes upturned at approximately 20°, absence of

horizontal accessory processes, large paradiapophyses, depressed cotyle and condyle tilted approximately 75° anteriorly, parazygantral foramina, ventrally smooth and rounded centrum with no subcentral ridges, and subcentral foramina located near mid-centrum. These features and overall size are matched in *Wonambi* as described by Smith (1976); abrasion of the paradiapophyses, and other damage, precludes detailed comparison of measurements. Therefore, while there are no observable features to distinguish P186652 from *W. naracoortensis*, an identification as cf *Wonambi naracoortensis* is preferred to emphasize the lack of unequivocal data.

### ELAPIDAE

Two smaller vertebrae (P184096 & P186597, Figs 5A, B, C) compare favourably with elapid vertebrae, but insufficient comparative material of northern Australian genera (colubrid and elapid) precludes detailed identification. They are sufficiently different to probably represent two separate elapid types.

### AVES

#### ANHINGIDAE

A right ulna (P184058: distal end plus shaft; Figs 5D, E) is the only bird material from Unit B. The distal articular area is characterised by a shallow intercondylar sulcus. This is created by a depressed dorsal condyle and an indistinct ventral condyle that rises to a blunt protuberance in line with an equally blunt carpal tuberculum. Papillae are spaced regularly along the shaft. Only the Anhingidae and the closely allied Phalacrocoracidae possess all these points of morphological detail. The shape and position of the blunt protuberance indicates placement within the Anhingidae.

#### *Anhinga melanogaster*

The features used to separate P184058 from the Phalacrocoracidae are matched in *A. melanogaster*, a modern species, the Darter, still to be found on the waterways of the region.

### ANATIDAE

Three damaged humeri and eight coracoids from Unit A are all attributed to anatids. The humeral

different pointed and blunt types of ziphoid teeth also raise the question of whether they represent a single heterodont crocodilian or several homodont crocodilian species. These questions will be resolved only when more complete material is found.

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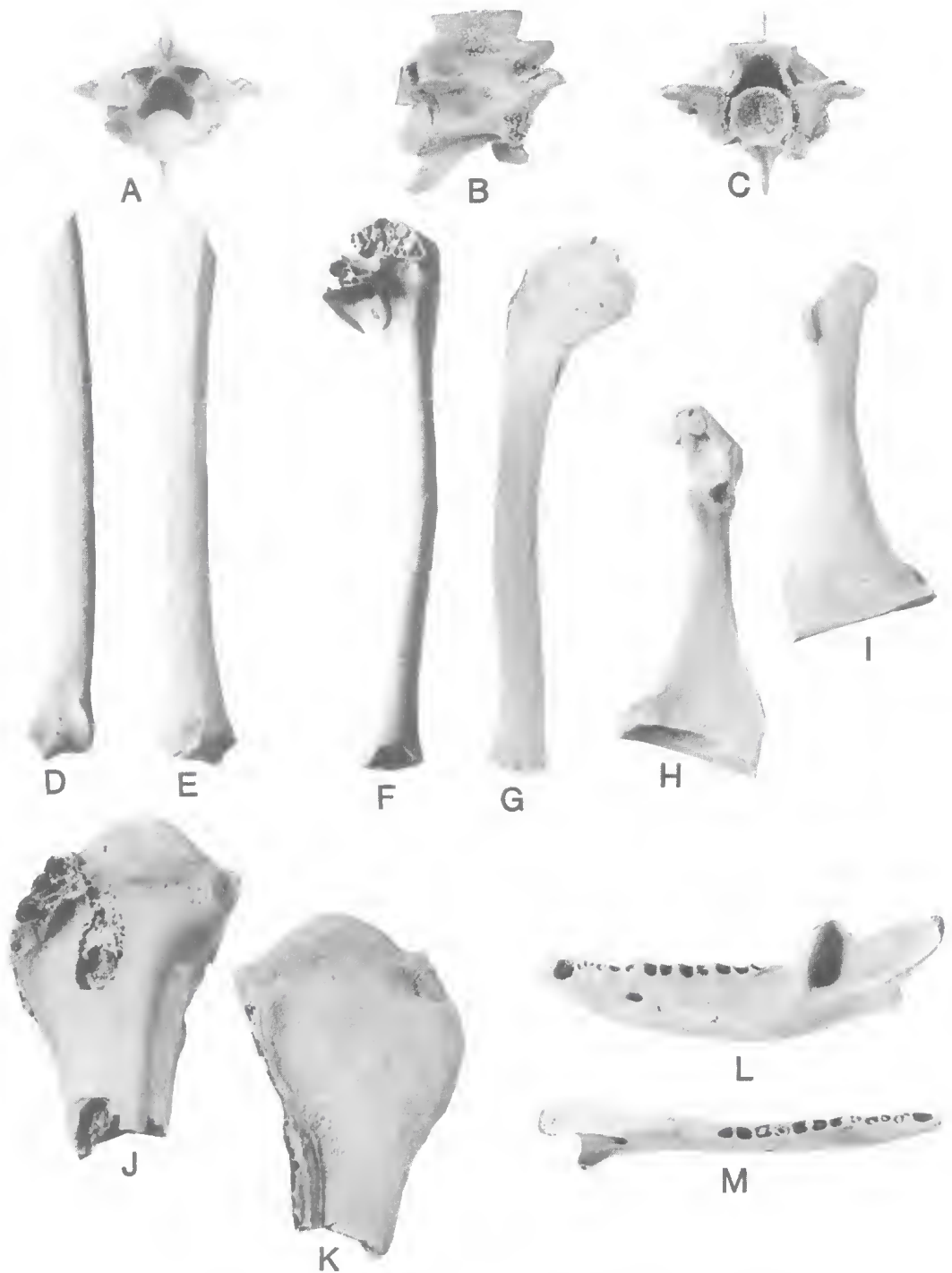


FIG. 5. A, B, C. Possible Elapid vertebra (P184096) in anterior (A), lateral (B) and posterior (C) aspects, X 2.0. D, E. *Anhinga melanogaster* right ulna (P184058), X 1.0. F, G. *Anas superciliosa* humerus (P186603), X 1.0. H, I. *Anas* sp. coracoid (P186598), X 1.0. J, K. *Anseranas semipalmata* humerus, proximal end (P184094), X 1.0. L, M. *Dasyurus* sp. cf. *D. geoffroyi* toothless dentary (P184064) in lateral (L) and dorsal (M) aspects, X 1.0.

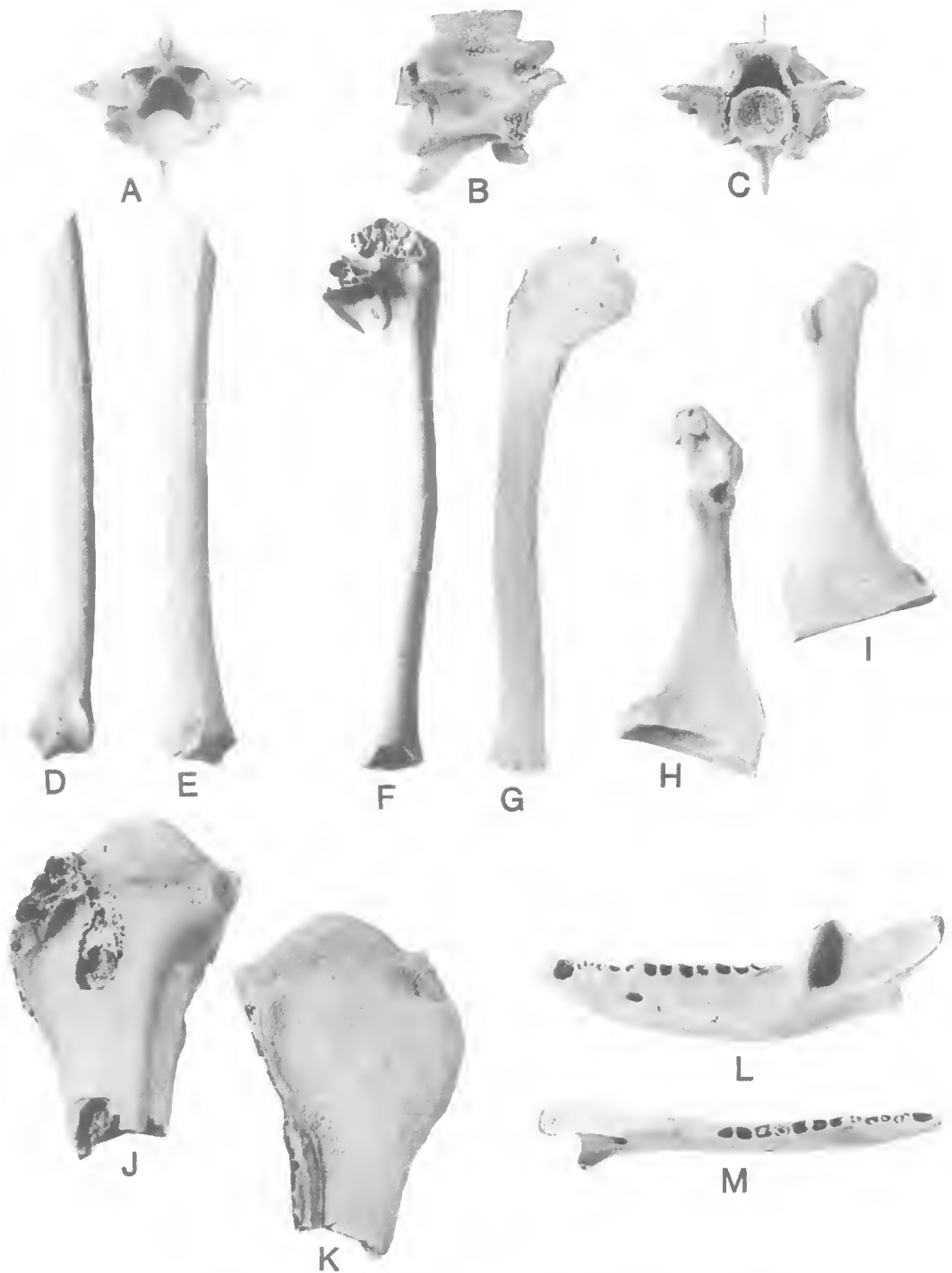


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fragments share no features that are absolutely diagnostic of the Anatidae in general, though most of the coracoids are sufficiently complete to assign them to the Anatidae on the basis of: i) a reduced procoracoid and brachial tuberosity, resulting in an indistinct triosseal canal; ii) the shape of the internal distal angle; iii) a groove situated antero-ventrally to the furcular facet on the distal "head" of the coracoid; and iv) the enlarged "keel" on the antero-ventral surface of the glenoid facet. The distinctive sternocoracoidal process, typical of anatids, has been lost through breakage in all cases.

#### **Anseranas semipalmata**

The largest of the three humeral fragments (P184094: proximal end only, Figs 5J, K) is abraded but exhibits enough characters for positive identification. The orientation of the deltoid crest, the reduced pneumatic fossa and the shape and position of the internal tuberosity are distinctive and allow P184094 to be identified confidently as *Anseranas semipalmata*, the Magpie Goose, a modern species that still ranges over the region. The size also matches that of modern adults.

#### **Anas superciliosa**

Specimen P186603 (proximal end and shaft, Figs 5F, G) is morphologically identical to the humerus of *A. superciliosa*, the Black Duck. The position of the deltoid crest and its associated tuberosities are the most obvious correspondences. This species is still common in the region. Coracoid P186598 (Figs 5F, G) may also correspond to *A. superciliosa*, but due to wear, and the close similarity of all *Anas* coracoids, this can only be a tentative identification.

#### **Anas sp.**

Coracoids of *Anas* are distinguished from those of other genera within the Anatidae by the shape of the internal distal angle and the bilobate furcular facet but they are difficult to assign to species, especially when they are abraded, because of their structural uniformity. P186598 may correspond with *A. superciliosa* (as above), and P186654 and P186601 may correspond to *A. castanea* (G. Van Tets, pers. comm.). They are clearly distinct from each other and yet too worn to be identified specifically.

### **MAMMALIA**

### **MARSUPIALIA**

### **DASYURIDAE**

#### **Dasyurus sp. cf. D. geoffroyi**

P184064 is a well-preserved but toothless dentary lacking the anterior portion of the ramus (Figs 5L, M). It is identical, both in morphology and size, to dentaries of adult *D. geoffroyi*. The specimen undoubtedly represents an adult *Dasyurus* but without dentition further identification is not possible.

#### **Antechinus sp.**

P183209 is the only fossil located *in situ* from the gravel stringers within the blue-grey clay of Unit A. This right dentary contains M<sub>2</sub> to M<sub>5</sub> but is incomplete more anteriorly (Figs 6A, B). It is about the same size as the jaw of an adult *A. flavipes*, but shows a slightly different arrangement of cusps on the trigonid. As insufficient comparative material was available no attempt has been made to identify this specimen more closely.

### **PERAMELIDAE**

#### **Isodon macrourus**

P183212 is a left M<sup>5</sup> which has a triangular outline in plan view, with a distinct anterior cingulum leading to a well developed protocone (Figs 6C, D). This morphology is typical of peramelid molars. The specimen has a large paracone, a pronounced parastyle and a slightly smaller mesostyle. It has no hypocone, but a posterior cingulum terminates at the base of the distinct posterior cusp. The distinct posterior cusp and the anterior cingulum rising below the parastyle are indicative of *Isodon* rather than *Perameles* (where the anterior cingulum rises between the parastyle and paracone). The posterior cusp is twice the width of the posterior cingulum where the cingulum terminates against the cusp, a condition unique to *I. macrourus* amongst *Isodon* species.

### **VOMBATIDAE**

#### **Phascolonus sp.**

fragments share no features that are absolutely diagnostic of the Anatidae in general, though most of the coracoids are sufficiently complete to assign them to the Anatidae on the basis of: i) a reduced procoracoid and brachial tuberosity, resulting in an indistinct triosseal canal; ii) the shape of the internal distal angle; iii) a groove situated antero-ventrally to the furcular facet on the distal "head" of the coracoid; and iv) the enlarged "keel" on the antero-ventral surface of the glenoid facet. The distinctive sternocoracoidal process, typical of anatids, has been lost through breakage in all cases.

#### *Anseranas semipalmata*

The largest of the three humeral fragments (P184094: proximal end only, Figs 5J, K) is abraded but exhibits enough characters for positive identification. The orientation of the deltoid crest, the reduced pneumatic fossa and the shape and position of the internal tuberosity are distinctive and allow P184094 to be identified confidently as *Anseranas semipalmata*, the Magpie Goose, a modern species that still ranges over the region. The size also matches that of modern adults.

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#### *Anas* sp.

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### VOMBATIDAE

#### *Phascolonus* sp.

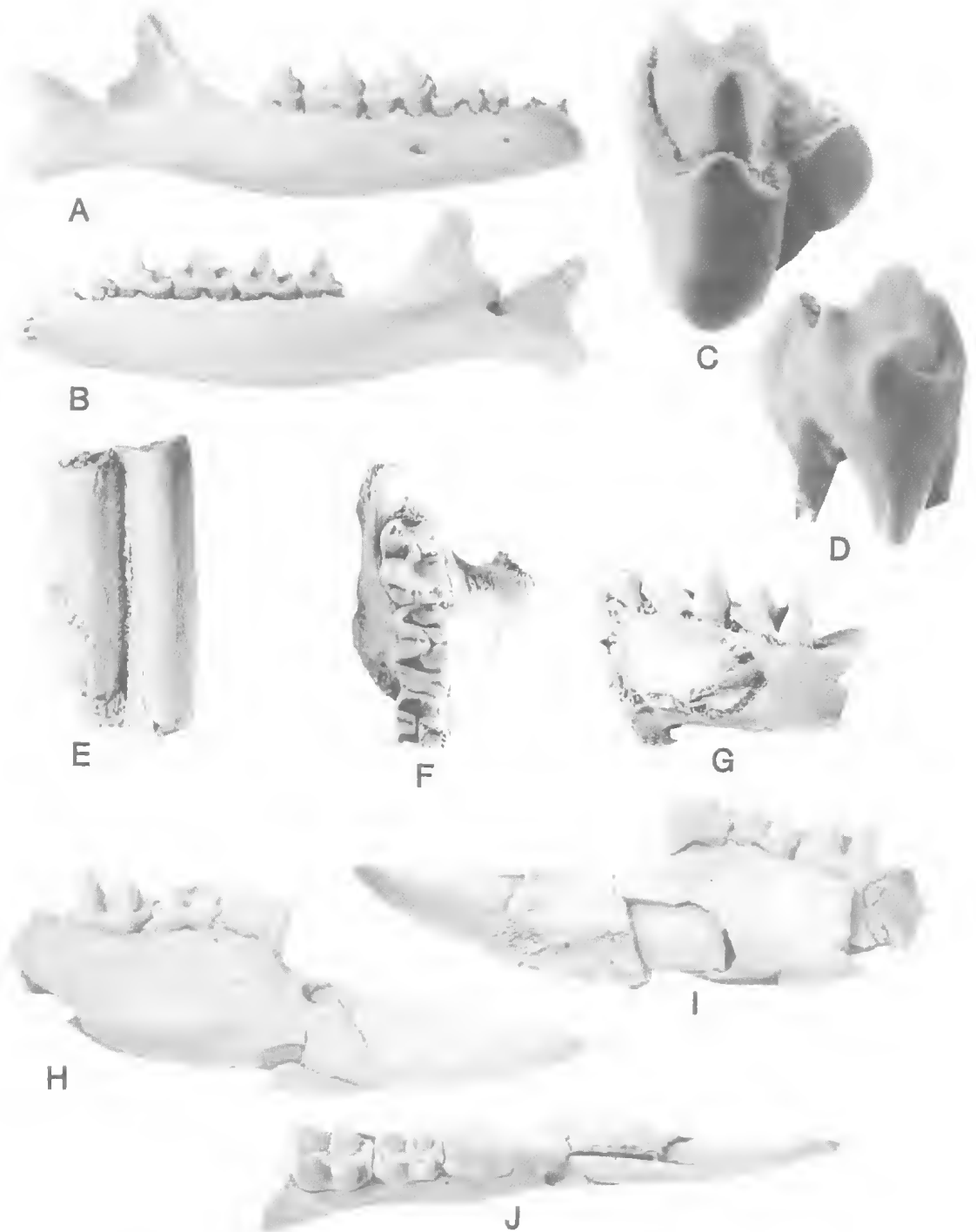


FIG. 6. A, B. *Antechinus* sp. dentary (P183209) in lateral buccal (A) and lateral lingual (B) aspects, X 5.0. C, D. Two oblique views of *Isodon macrourus* left upper  $M^3$  (P183212), X 10.0. E. *Phasc colonus* sp. molar fragment (P186855) in lateral aspect, X 1.0. F, G. Maxilla fragment from unidentified macropodid (P184042) in occlusal (F) and lateral (G) aspects, X 1.0. H, I, J. Unidentified juvenile macropodid dentary (P184052) in lateral buccal (H), lateral lingual (I) and dorsal (J) aspects, X 1.0.

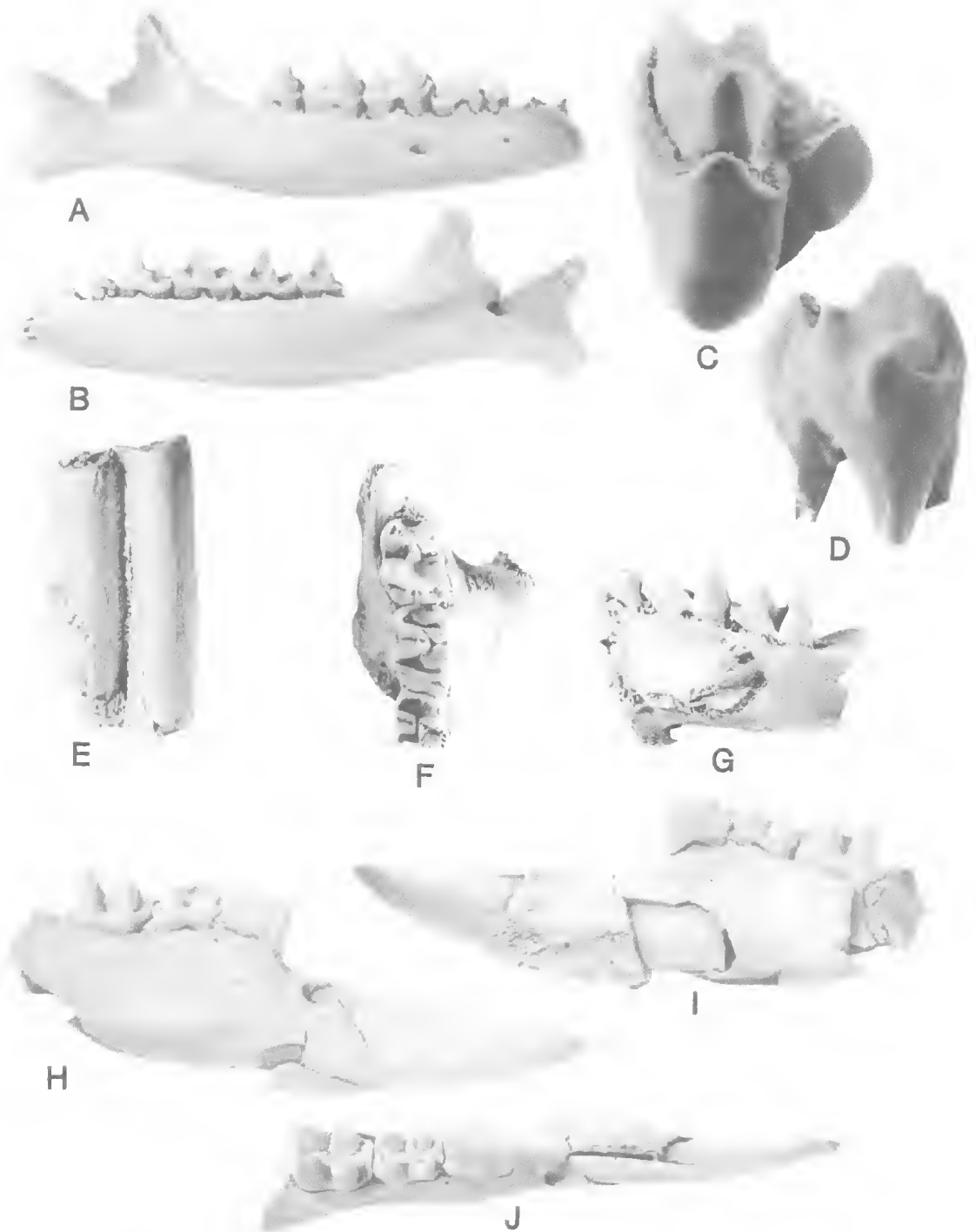


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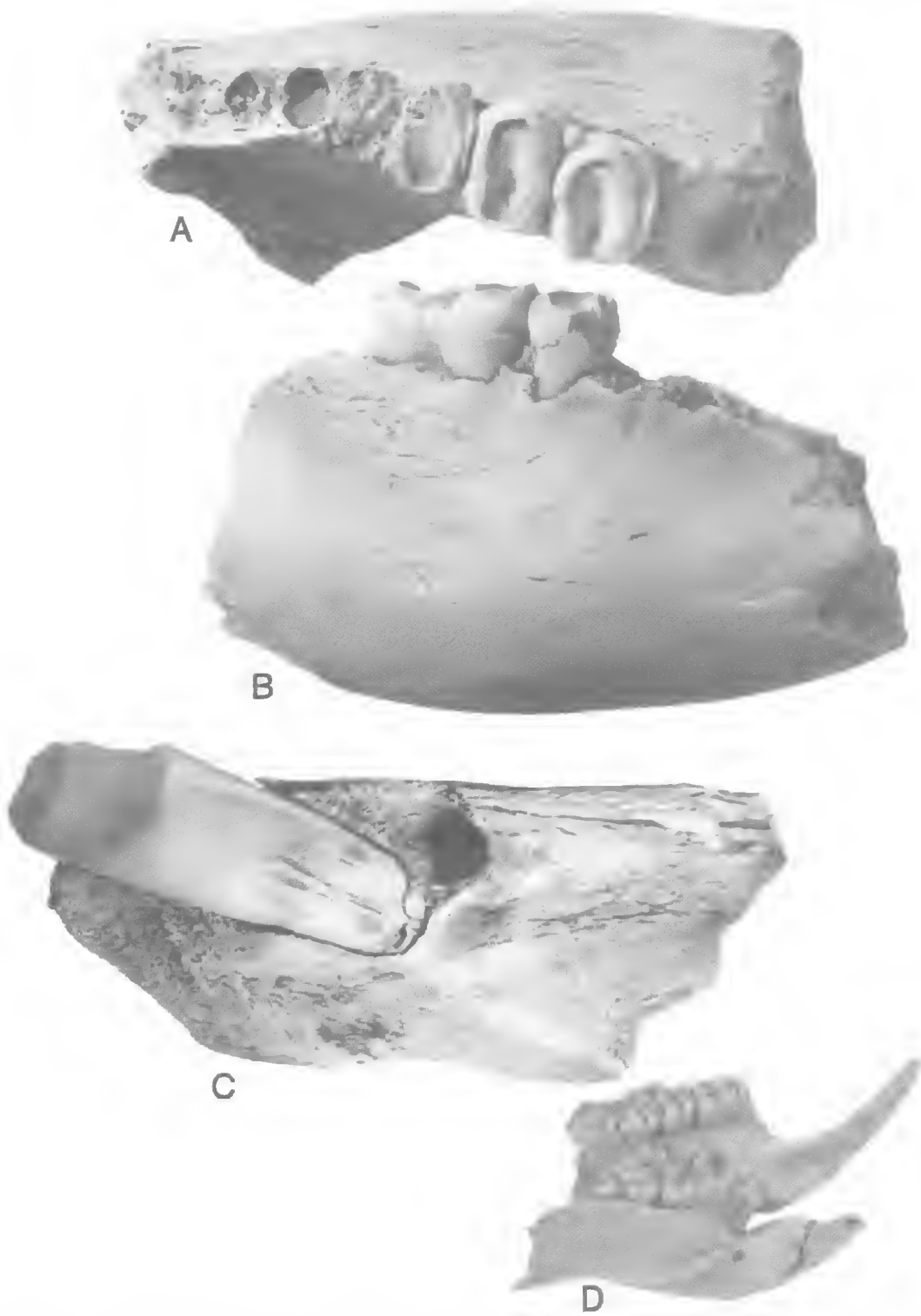


FIG. 7. A, B. Unidentified (?*Euowenia* sp.) diprotodontid dentary (P183996) in lateral (A) and dorsal (B) aspects, X 0.5. C. *Diprotodon optatum* premaxilla fragment (P186656) in occlusal aspect, X 0.5. D. *Rattus* sp. cf. *R. sordidus* dentary pair (P184047) in oblique dorsal aspect, X 2.6.

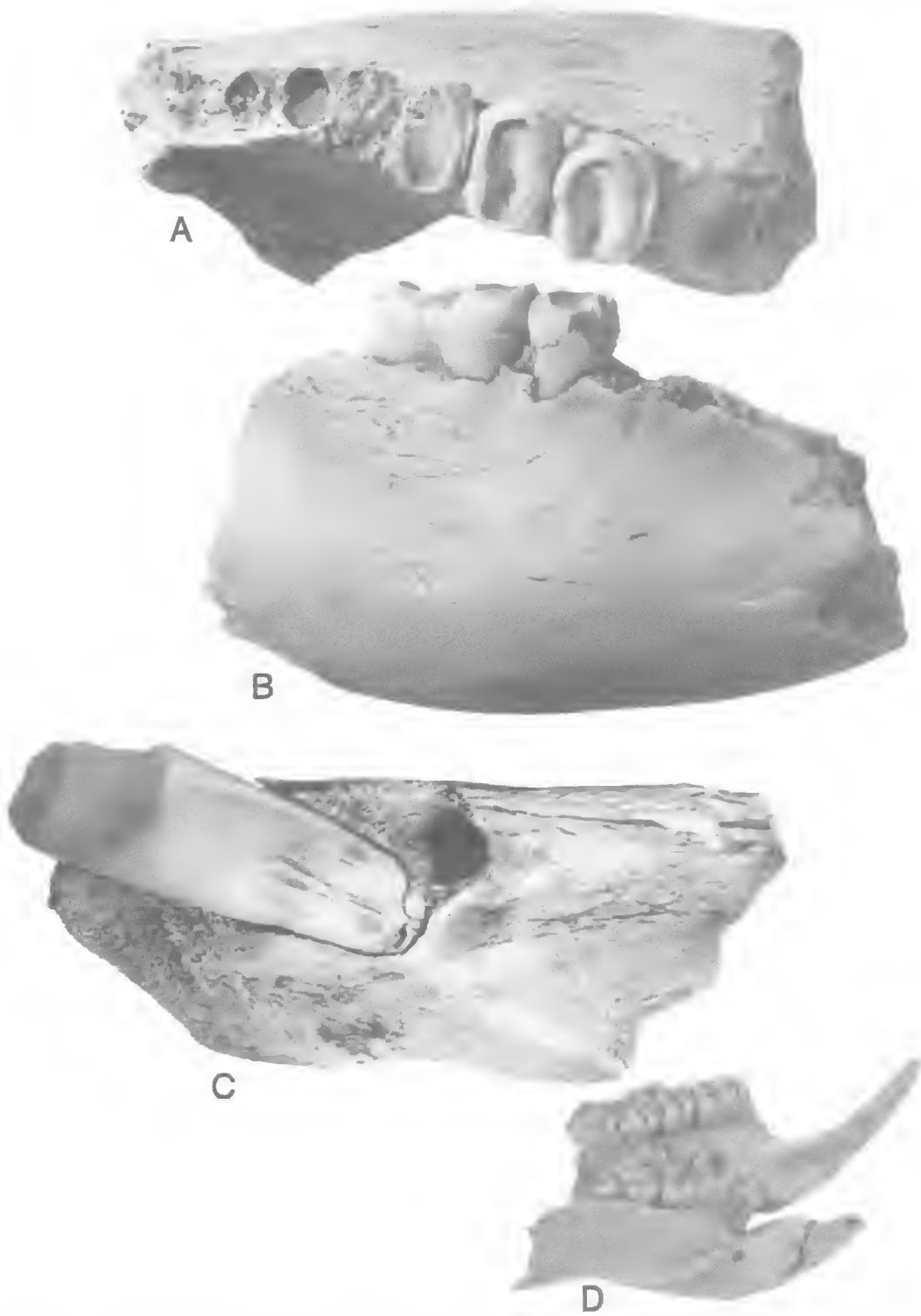


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P186655 consists of a single large molar fragment (Fig. 6E). It is hypsodont and is markedly divided into two columns, subequal in width (12.1 mm & 11.6 mm), with a maximum anterior-posterior distance of 22.3 mm. Evidently this specimen represents a very large wombat, within the size range of *Phascolonus* (Dawson, 1981), but no closer identification is possible.

## MACROPODIDAE

### Unidentified macropodids

Many fragmentary macropodid remains have been found, including maxilla fragments (e.g. Figs 6F, G), dentaries (e.g. Figs 6H, I, J), isolated molars and premolars, and fragmentary postcranial material. More precise identifications should emerge from current investigation.

## PALORCHESTIDAE

### Unidentified palorchestid(s)

P186593, P186594 and P186595 represent probable palorchestid molar, incisor, and premolar respectively. All three specimens clearly have palorchestid affinities but they are sufficiently different from known palorchestid forms to warrant further research. The Palorchestidae is currently under revision and these specimens will be examined in that work (M. Archer, pers. comm.).

## DIPROTODONTIDAE

### ?*Euowenia* sp.

A diprotodontid dentary fragment with worn M<sub>3</sub> and M<sub>4</sub> intact (P183996) is tentatively identified as *Euowenia*. This identification rests only on the shape of the molars in occlusal view, as typified by *E. robusta* (Figs 7A, B). The molars are extremely worn, but their outline is clearly not matched in *Diprotodon optatum*, where the molars are far less ovoid in plan view.

### *Diprotodon optatum*

A premaxillary fragment of a large diprotodontid with I<sup>2</sup> intact and containing alveoli I<sup>1</sup> and I<sup>3</sup> (P186656) is identified as *Diprotodon optatum* on the basis of the distinctive outline of

the I<sup>1</sup> and the shape and relative position of I<sup>2</sup> (Fig. 7C).

### Unidentified diprotodontid

P186657 is a diprotodontid humerus. Its outstanding feature is a broad flattening of the distal articular area, similar to that seen in *Zygomaturus*. No other features seem sufficiently diagnostic to allow further identification.

## EUTHERIA

### MURIDAE

### *Rattus* sp. cf. *R. sordidus*

A large number of murid maxillary fragments (e.g. P183238, P184075) and isolated upper and lower teeth (e.g. P184078, P184082) were obtained from a single lens in Unit A. A single pair of dentaries plus incisors was isolated from Unit B (P184047; Fig. 7D). All may be referable to *R. sordidus* (H. Godthelp, pers. comm.).

### ?*Pseudomys* sp.

A single dentary fragment from Unit A (P184074) is tentatively attributed to *Pseudomys* (H. Godthelp, pers. comm.), but is too incomplete to allow closer identification.

## DISCUSSION

The Wyandotte Local Fauna comprises disarticulated and fluviially transported, but nonetheless well-preserved, elements of Pleistocene age and merits further detailed description. The purpose of this paper is to document the existence of the fauna and to put on record its dated context. There are few dated Quaternary vertebrate fossil sites in Australia and even the Pleistocene is not so well served in that regard as it might be. The depositional setting of the Wyandotte Formation is clear, and the dated horizons are well-defined. The dates obtained are unambiguous but indicate the need to utilize techniques other than conventional <sup>14</sup>C to place the stratigraphic context of the fossil-bearing horizons within the Pleistocene. The fauna has already proved of interest, even at this preliminary stage, in that:

i) the temporal and geographic ranges of *Megalania prisca*, *Wonambi*, and *Meiolania* have been greatly extended;

P186655 consists of a single large molar fragment (Fig. 6E). It is hypsodont and is markedly divided into two columns, subequal in width (12.1 mm & 11.6 mm), with a maximum anterior-posterior distance of 22.3 mm. Evidently this specimen represents a very large wombat, within the size range of *Phascolonus* (Dawson, 1981), but no closer identification is possible.

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## DIPROTODONTIDAE

### ?*Euowenia* sp.

A diprotodontid dentary fragment with worn M<sub>3</sub> and M<sub>4</sub> intact (P183996) is tentatively identified as *Euowenia*. This identification rests only on the shape of the molars in occlusal view, as typified by *E. robusta* (Figs 7A, B). The molars are extremely worn, but their outline is clearly not matched in *Diprotodon optatum*, where the molars are far less ovoid in plan view.

### *Diprotodon optatum*

A premaxillary fragment of a large diprotodontid with I<sup>2</sup> intact and containing alveoli I<sup>1</sup> and I<sup>3</sup> (P186656) is identified as *Diprotodon optatum* on the basis of the distinctive outline of

the I<sup>1</sup> and the shape and relative position of I<sup>2</sup> (Fig. 7C).

### Unidentified diprotodontid

P186657 is a diprotodontid humerus. Its outstanding feature is a broad flattening of the distal articular area, similar to that seen in *Zygomaturus*. No other features seem sufficiently diagnostic to allow further identification.

## EUTHERIA

### MURIDAE

#### *Rattus* sp. cf. *R. sordidus*

A large number of murid maxillary fragments (e.g. P183238, P184075) and isolated upper and lower teeth (e.g. P184078, P184082) were obtained from a single lens in Unit A. A single pair of dentaries plus incisors was isolated from Unit B (P184047; Fig. 7D). All may be referable to *R. sordidus* (H. Godthelp, pers. comm.).

#### ?*Pseudomys* sp.

A single dentary fragment from Unit A (P184074) is tentatively attributed to *Pseudomys* (H. Godthelp, pers. comm.), but is too incomplete to allow closer identification.

## DISCUSSION

The Wyandotte Local Fauna comprises disarticulated and fluviially transported, but nonetheless well-preserved, elements of Pleistocene age and merits further detailed description. The purpose of this paper is to document the existence of the fauna and to put on record its dated context. There are few dated Quaternary vertebrate fossil sites in Australia and even the Pleistocene is not so well served in that regard as it might be. The depositional setting of the Wyandotte Formation is clear, and the dated horizons are well-defined. The dates obtained are unambiguous but indicate the need to utilize techniques other than conventional <sup>14</sup>C to place the stratigraphic context of the fossil-bearing horizons within the Pleistocene. The fauna has already proved of interest, even at this preliminary stage, in that:

i) the temporal and geographic ranges of *Megalania prisca*, *Wonambi*, and *Meiolania* have been greatly extended;

- ii) much of the described fauna has been tied to reliable dates within the Pleistocene for the first time; and
- iii) there is tantalizing evidence for the existence of previously undescribed taxa (e.g. palorchestids) in concert with extended ranges for known faunal elements. The Wyandotte fauna confirms that the Pleistocene of northern Australia is as yet far from well-known and worthy of much more detailed investigation.

## ACKNOWLEDGEMENTS

Work on this fauna would not have been possible without the co-operation of Joy and Eddie Marsterson of Wyandotte Station, who kindly allowed access to the mapped area and generously provided other assistance. Sue and Peter Burger of Greenvale also generously provided assistance and accommodation. Peter Staunton is thanked for his sieving efforts back in Townsville, and Neil Mockett for his efforts entailing the near loss of his thumb. Peter, Sue, Alexander, Ben, Michelle and Lara Burger; Peter and Jill Staunton; Kerry Williamson; Lindsay Williams, Rosemary and Andrew O'Hearn; Neil, Richard, Justin and Santana Mockett; Jim, Margaret and Martin Darley; Roger, Peter and Judy Quick; Mark Audley; Doug Haywick; Bob Henderson; Alister Stephens; Danny Spence; Trevor Beardsmore; Jane Dye; Eleanor Adkins; Tom Rich; Gene Gaffney and Daniel and Hilary McNamara all assisted in the excavation of fossil material at one time or another and are greatly thanked. Financial support was received from James Cook University special research grants. A donation from the Fossil Collectors Association of Australasia gave initial help for which special thanks is given.

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